



Dart Aerospace Ltd.  
1270 Aberdeen St  
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K6A 1K7  
Canada

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3

**D119-796-141**  
**Job Sheet 174966**



Part No: D119-796-141

Job Qty: 1 ea

Part Name: Fwd Crosstube Installation Without Step (No Hardware)



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 3/23/18

Job Tracking No:

Due Date: 5/28/18

Created By: Michelle Gagnon-Donovan

Type: SOLD

Description:

Note: DRWG D119-795-141 IPP REV:C 14.11.19 AS PER REV.C DD VERF:JLM IPP REV:D 14.12.12 AS PER REV:pd1 DD VERF:JLM IPP REV:E 15.02.11 AS PER REV F JLM VERIFIED BY:DD

Ship Via:

D119-796-141 Rev. H IIV-D119-796 Rev. F

DAS  
35  
9-80

### Bill of Materials

### Job Routing

| Op No | Operation           | Qty   | Start Date | Due Date | Standard  |         | Workcenter/Supplier   |           | Sign-off               |
|-------|---------------------|-------|------------|----------|-----------|---------|-----------------------|-----------|------------------------|
|       |                     |       |            |          | Setup hrs | Run Hrs | Workcenter / Supplier | Lead Time |                        |
| 90    | Start up Operation  | 1 Ea  |            | 5/25/18  | 0.00      | 0.00    | Start Up Crosstubes-1 |           | GP                     |
| 130   | CNC Bend Crosstubes | 1 pcs |            | 5/25/18  | 0.00      | 3.85    | CNC Bend Crosstube    |           | GP DAS                 |
| 140   | QC                  | 1 pcs |            | 5/25/18  | 0.00      | 0.00    | QC15                  |           | 35                     |
| 145   | Crosstubes          | 1 pcs |            | 5/25/18  | 0.00      | 3.06    | Crosstubes-1          |           | GP 3-55                |
| 150   | Crosstubes          | 1 pcs |            | 5/25/18  | 0.00      | 3.06    | Crosstubes-1          |           | GP                     |
| 160   | HandFXtube          | 1 pcs |            | 5/25/18  | 0.00      | 1.49    | HandFinish5           |           | GP                     |
| 175   | QC                  | 1 pcs |            | 5/25/18  | 0.00      | 0.00    | QC7-1                 |           |                        |
| 180   | Outsource           | 1 pcs |            | 5/25/18  |           |         | SKY002-VC 397413      |           | CY18/05/01 AT R107X    |
| 190   | Packaging           | 1 pcs |            | 5/25/18  | 0.00      | 0.00    | Packaging1-1          |           | AT 18/05/01            |
| 200   | QC                  | 1 pcs |            | 5/25/18  | 0.00      | 0.00    | QC5                   |           | 35                     |
| 230   | SprayPaint          | 1 pcs |            | 5/25/18  | 0.00      | 1.36    | Spray Paint           |           | AR MAY 16 2018         |
| 240   | QC                  | 1 pcs |            | 5/25/18  | 0.00      | 0.00    | QC14                  |           | AR                     |
| 242   | Crosstubes          | 1 pcs |            | 5/26/18  | 0.00      | 3.06    | Crosstubes-1          |           | AR JUL 14 2018         |
| 244   | QC                  | 1 pcs |            | 5/26/18  | 0.00      | 0.00    | QC5                   |           | AR                     |
| 246   | SprayPaint          | 1 pcs |            | 5/26/18  | 0.00      | 1.36    | Spray Paint           |           | AR AUG 02 2018         |
| 248   | SprayPaint          | 1 pcs |            | 5/26/18  | 0.00      | 1.36    | Spray Paint           |           | AR AUG 02 2018         |
| 250   | QC                  | 1 pcs |            | 5/26/18  | 0.00      | 0.00    | QC14                  |           | AR 13-05-03            |
| 252   | Crosstubes          | 1 pcs |            | 5/28/18  | 0.00      | 3.06    | Crosstubes-1          |           | AR AUG 02 2018         |
| 260   | QC                  | 1 pcs |            | 5/28/18  | 0.00      | 0.00    | QC5                   |           | AR 13-05-03            |
| 275   | DC                  | 1 pcs |            | 5/28/18  | 0.00      | 0.00    | DC                    |           | AR                     |
| 290   | Packaging           | 1 pcs |            | 5/28/18  | 0.00      | 0.00    | Packaging3-1 LG050    |           | AR AUG 02 2018         |
| 300   | QC21-FG             | 1 Ea  |            | 5/28/18  | 0.00      | 0.00    | QC21                  |           | AR 21 9-80 AUG 03 2018 |

Part Op 130 - Bend tube as per Dwg D119-796-141 using CNC bender program

Descriptions: 145 - 1- CUT TUBE AT HEIGHT ON FAI SHEET 2- VERFY HEIGHT: \_\_\_\_\_ BY QC15 LEVEL

INSPECTOR: \_\_\_\_\_ 3- DEBURR CUT SURFACE

150 - \*\*\*\*\* ENSURE PROPER JIG POSITIONING \*\*\*\*\* ENSURE PROPER JIG POSITIONING

\*\*\*\*\* 1-DRILL TUBE AS PER DWG USING DT \_\_\_\_\_ 2- DRILL RIVET HOLES USING DT8787 FWD 3- DEBURR AND C'SINK RIVET HOLES AS PER DWG 4- FLIP TUBE, REPEAT STEP 2 AND 3 5- SCRIBE PART# AND BATCH# USING VIBRATING STYLUS ON INSIDE OF CUFF AS PER DWG D119-796-141 6- INSPECT AND REMOVE ALL MARKS FROM TUBE WITHIN LIMITS ON DWG D119-796-141

160 - \*\*\*IMMEDIATELY AFTER GRINDING\*\*\* 1- handfinish X-TUBE INSIDE AND OUT 2- ALODINE AND ACID ETCH X-TUBE INSIDE AND OUT AS PER QSI005.

180 - \*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSTUBE\*\*\* Liquid Penetrant Inspection as per QSI 038Or

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**Container No: S062453**



**Part: D119-796-141**

**Job No: 174966**

**Serial No/Batch: S062453**

**Revision:**

**Inspector:**

Date: 04/18/18



Issue P/O: \_\_\_\_\_ LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order

190 - Ensure copy of NDT results attached to work order.

200 - \*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\* Inspect for damage &amp; ensure results are as per Dwg D119-796-141

230 - \*\*\*VERIFY BY \_\_\_\_\_ BATCH # TO MATCH W/O \_\_\_\_\_ \*\*\*VERIFY BY \_\_\_\_\_ PART # TO MATCH W/O \_\_\_\_\_ \*\*\*MASK SCRIBE B# &amp; P# AND VERIFY\*\*\* 1- Prime Inside of tube. 2- Install nut plates as per dwg (D2873-043) 3- Mask cuffs per note#2. 4- Prime exterior of tube per QSI005. Primer

Batch: 138687 Start Time: \_\_\_\_\_ Finish Time: \_\_\_\_\_

240 - \*\*\*VERIFY BY \_\_\_\_\_ BATCH # TO MATCH W/O \_\_\_\_\_

242 - Assemble as per dwg D119-796-141 and Qsi 015 1- Abrade mating surfaces with Scotch Brite 7447 and clean with Dupont 4105s or equivalent as per dwg. 2- Install D5152-041 with proseal 890 on concave surface, 0.100" MIN thick as per dwg using DT10089 (identified right and left) \*\*\*\*MAINTAIN CLAMPING PRESSURE ON FOR MIN 72HRS\*\*\*\*

Proseal Batch: 138848 EXP: 11/18 PROSEAL CURE TIME 72 HOURS:

Start: \_\_\_\_\_ Finish: \_\_\_\_\_ 3- Install support and shim using proseal 890 per dwg and clamp in position.

244 - \*\*\*VERIFY BY \_\_\_\_\_ BATCH # TO MATCH W/O \_\_\_\_\_

246 - \*\*\*VERIFY BY \_\_\_\_\_ BATCH # TO MATCH W/O \_\_\_\_\_ 1- Remove all non-fixed hardware and clean any excess proseal. 2- Scuff tube with Scotch Brite 7447. 3- Mask cuff per note#2. 4- Prime as per dwg and QSI005 5- Apply matte clear as per dwg and QSI005 Clear Batch: \_\_\_\_\_

248 - \*\*\*VERIFY BY \_\_\_\_\_ BATCH # TO MATCH W/O \_\_\_\_\_ 1- Mask underside of tube as per dwg. Mask cuff per note#2. 2- Scuff tube with Scotch Brite 7447 3- Paint outside of crosstube Paint

Batch: \_\_\_\_\_

250 - \*\*\*VERIFY BY \_\_\_\_\_ BATCH # TO MATCH W/O \_\_\_\_\_

252 - 1- Re-install non fixed hardware per dwg \*\*\*Torque all clamps to 80-100 IN-LBS.\*\*\* 2- Apply a filet-seal of proseal 890 around supports. Allow proseal to dry before inspecting. Proseal 890 Batch: \_\_\_\_\_

EXP: \_\_\_\_\_ PROSEAL CURE TIME 72 HOURS: Start: \_\_\_\_\_

Finish: \_\_\_\_\_

260 - \*\*\*RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED AS PER DWG.\*\*\* \*\*\*VERIFY BY \_\_\_\_\_ BATCH # TO MATCH W/O \_\_\_\_\_

275 - Photocopy bluefile and create labels as per PPP D119-796-141 chg 004

290 - Identify and pack for shipping as per PPP D119-796-141 on w/o 174923

## Job BOM

| Part / Item              | Component Name           | Quantity      | Operation             | Container |
|--------------------------|--------------------------|---------------|-----------------------|-----------|
| D119-796-141TRN          | Crosstube Turning Detail | 1 Ea (1 ea)   | 90-Start up Operation |           |
| CR3212-4-08              | Rivet                    | 16 Ea (16 ea) | 242-Crosstubes        |           |
| D2873-043 <u>5060186</u> | Nut Plate Assembly       | 4 Ea (4 ea)   | 242-Crosstubes        |           |
| D5123-3                  | Clamp Cushion            | 4 Ea (4 ea)   | 242-Crosstubes        |           |
| D5124-1                  | Fwd Support              | 2 Ea (2 ea)   | 242-Crosstubes        |           |
| D5152-041                | Fwd Post Mount Assembly  | 2 Ea (2 ea)   | 242-Crosstubes        |           |
| D5305-1                  | Shim                     | 2 Ea (2 ea)   | 242-Crosstubes        |           |
| MS21920-24               | Clamp                    | 4 Ea (4 ea)   | 252-Crosstubes        |           |

## Job Allocations

| Operation             | Component Part             | Required                | Inventory | Allocated |
|-----------------------|----------------------------|-------------------------|-----------|-----------|
| 90-Start up Operation | D119-796-141TRN            | 1                       | 3         | 0         |
| 242-Crosstubes        | CR3212-4-08 <u>5000545</u> | <u>16</u>               | 116       | 0         |
|                       | D2873-043 <u>5050177</u>   | <u>4</u>                | 67        | 0         |
|                       | D5123-3 <u>5006028</u>     | <u>4</u>                | 318       | 0         |
|                       | D5124-1 <u>5081276</u>     | <u>2</u>                | 10        | 0         |
|                       | D5152-041 <u>5051887</u>   | <u>2</u>                | 14        | 0         |
|                       | D5305-1 <u>5053406</u>     | <u>2</u>                | 19        | 0         |
| 252-Crosstubes        | MS21920-24 <u>5024696</u>  | <u>4</u> <u>2 scrap</u> | 65        | 0         |

| Part Specifications |                                    |                                |                    |      |                  |
|---------------------|------------------------------------|--------------------------------|--------------------|------|------------------|
| Spec No             | Description                        | Target/Tolerance               | Limits             | Type | Special Comments |
| 1                   | Crosstube Assembly (AW119 MKI Fwd) | 6.000Inches ± 0.030            | 6.030<br>5.970     |      |                  |
| 2                   | Crosstube Assembly (AW119 MKI Fwd) | 2.516Inches ± 0.005            | 2.521<br>2.511     |      |                  |
| 3                   | Crosstube Assembly (AW119 MKI Fwd) | 2.333Inches + 0.005<br>- 0.000 | 2.338<br>2.333     |      |                  |
| 4                   | Crosstube Assembly (AW119 MKI Fwd) | 2.333Inches + 0.005<br>- 0.000 | 2.338<br>2.333     |      |                  |
| 5                   | Crosstube Assembly (AW119 MKI Fwd) | 2.408Inches + 0.005<br>- 0.000 | 2.413<br>2.408     |      |                  |
| 6                   | Crosstube Assembly (AW119 MKI Fwd) | 2.502Inches + 0.005<br>- 0.000 | 2.507<br>2.502     |      |                  |
| 7                   | Crosstube Assembly (AW119 MKI Fwd) | 2.596Inches + 0.005<br>- 0.000 | 2.601<br>2.596     |      |                  |
| 8                   | Crosstube Assembly (AW119 MKI Fwd) | 2.596Inches + 0.005<br>- 0.000 | 2.601<br>2.596     |      |                  |
| 9                   | Crosstube Assembly (AW119 MKI Fwd) | 6.000Inches ± 0.030            | 6.030<br>5.970     |      |                  |
| 10                  | Crosstube Assembly (AW119 MKI Fwd) | 2.516Inches ± 0.005            | 2.521<br>2.511     |      |                  |
| 11                  | Crosstube Assembly (AW119 MKI Fwd) | 2.333Inches + 0.005<br>- 0.000 | 2.338<br>2.333     |      |                  |
| 12                  | Crosstube Assembly (AW119 MKI Fwd) | 2.333Inches + 0.005<br>- 0.000 | 2.338<br>2.333     |      |                  |
| 13                  | Crosstube Assembly (AW119 MKI Fwd) | 2.408Inches + 0.005<br>- 0.000 | 2.413<br>2.408     |      |                  |
| 14                  | Crosstube Assembly (AW119 MKI Fwd) | 2.502Inches + 0.005<br>- 0.000 | 2.507<br>2.502     |      |                  |
| 15                  | Crosstube Assembly (AW119 MKI Fwd) | 2.596Inches + 0.005<br>- 0.000 | 2.601<br>2.596     |      |                  |
| 16                  | Crosstube Assembly (AW119 MKI Fwd) | 2.596Inches + 0.005<br>- 0.000 | 2.601<br>2.596     |      |                  |
| 17                  | Crosstube Assembly (AW119 MKI Fwd) | 102.260Inches ± 0.020          | 102.280<br>102.240 |      |                  |

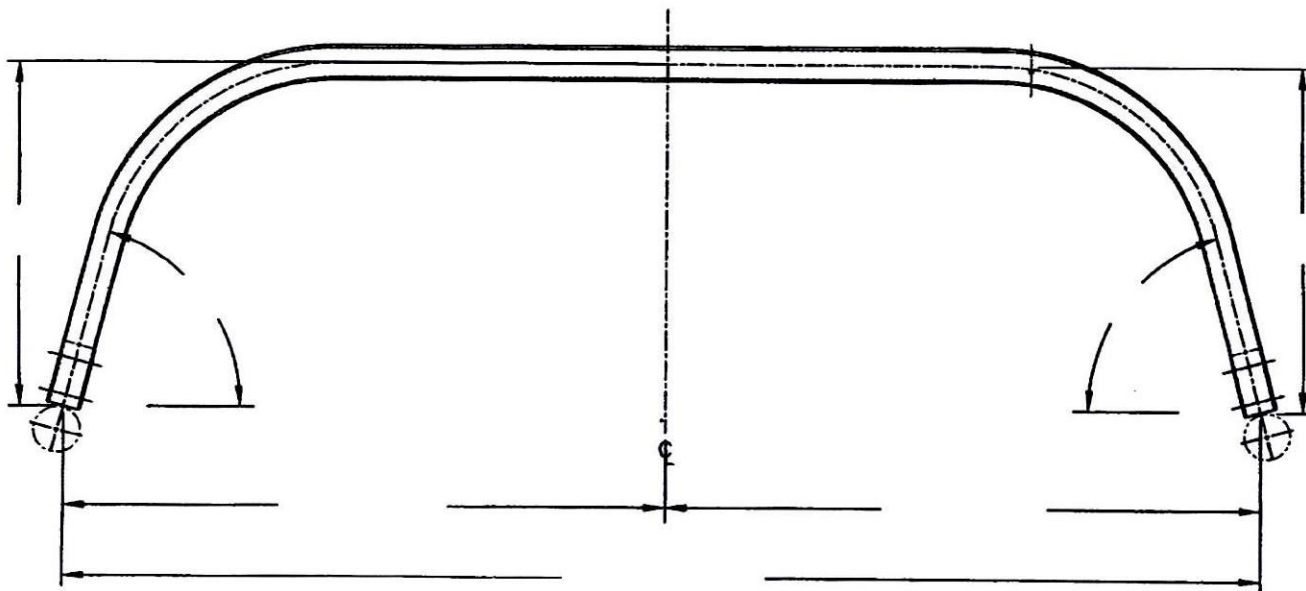
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|                                                   |  |                                  |                    |
|---------------------------------------------------|--|----------------------------------|--------------------|
| <b>DART AEROSPACE LTD</b>                         |  | <b>Work Order:</b> 174966        |                    |
| <b>Description:</b> Crosstube Fwd, with Step      |  | <b>Part Number:</b> D119-796-141 |                    |
| <b>Inspection Dwg:</b> D119-796-141 <b>Rev:</b> H |  |                                  | <b>Page 1 of 1</b> |

| Required Dimension | Min    | Max    |
|--------------------|--------|--------|
| Height             | 21.490 | 21.750 |
| 1/2 Span           | 39.820 | 40.080 |
| Angle              | 54°    | 57°    |
| Total Span         | 79.640 | 80.160 |
| Bending Passes     | 8      | --     |
| Crushing           | --     | 6.8%   |



|                | Side A | Side B |
|----------------|--------|--------|
| Bending Passes |        |        |
| Crushing       |        |        |
| Comments       |        |        |
|                |        |        |
|                |        |        |
|                |        |        |
|                |        |        |

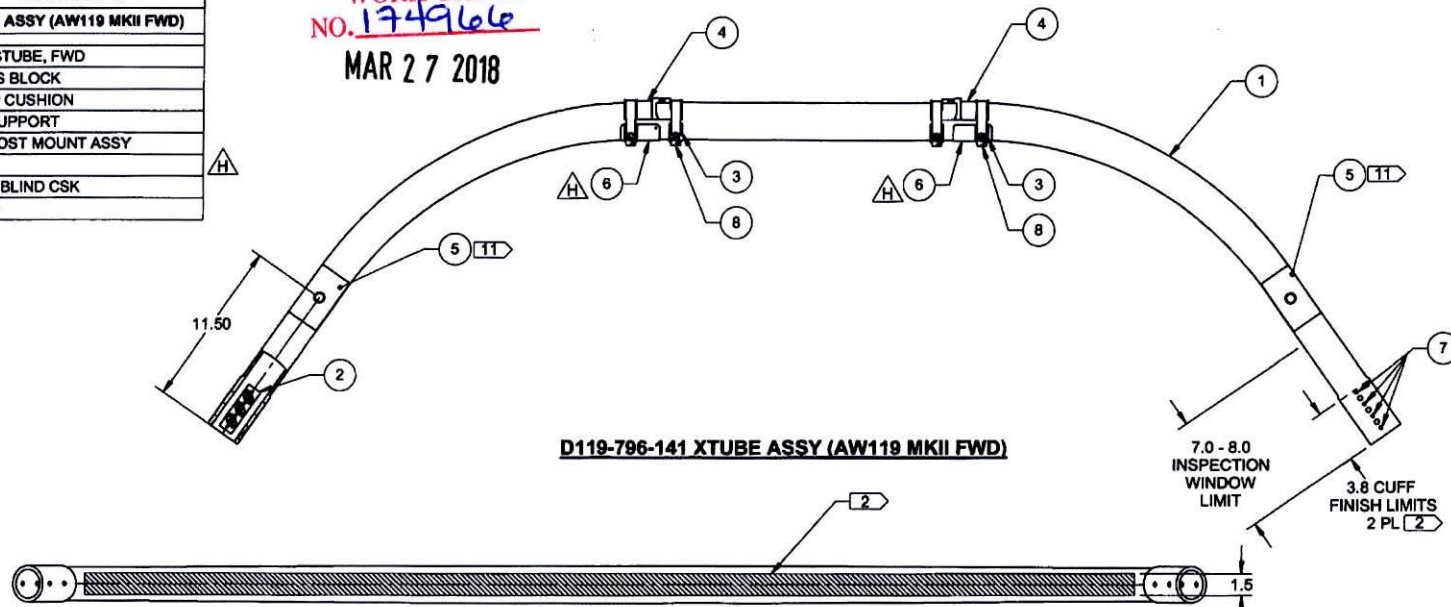
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|-----------------|--|
| QC15 Inspection |  |
| Date            |  |

| Rev | Date     | Change          | Revised by | Approved |
|-----|----------|-----------------|------------|----------|
| A   | 15.04.14 | New Issue       | KJ         |          |
| B   | 15.11.12 | Dwg Rev updated | KJ         |          |
| C   | 16.01.15 | Dwg Rev updated | KJ         | up       |

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WITHOUT NOTICE  
WORK ORDER  
NO. 174966

MAR 27 2018

| ITEM | QTY | P/N             | DESCRIPTION                 |
|------|-----|-----------------|-----------------------------|
|      | X   | D119-796-141    | XTUBE ASSY (AW119 MKII FWD) |
| 1    | 1   | D119-796-141BND | CROSSTUBE, FWD              |
| 2    | 4   | D2873-043       | RADIUS BLOCK                |
| 3    | 4   | D5123-3         | CLAMP CUSHION               |
| 4    | 2   | D5124-1         | FWD SUPPORT                 |
| 5    | 2   | D5152-041       | FWD POST MOUNT ASSY         |
| 6    | 2   | D5305-1         | SHIM                        |
| 7    | 16  | CR3212-4-08     | RIVET, BLIND CSK            |
| 8    | 4   | MS21920-24      | CLAMP                       |



D119-796-141 XTUBE ASSY (AW119 MKII FWD)

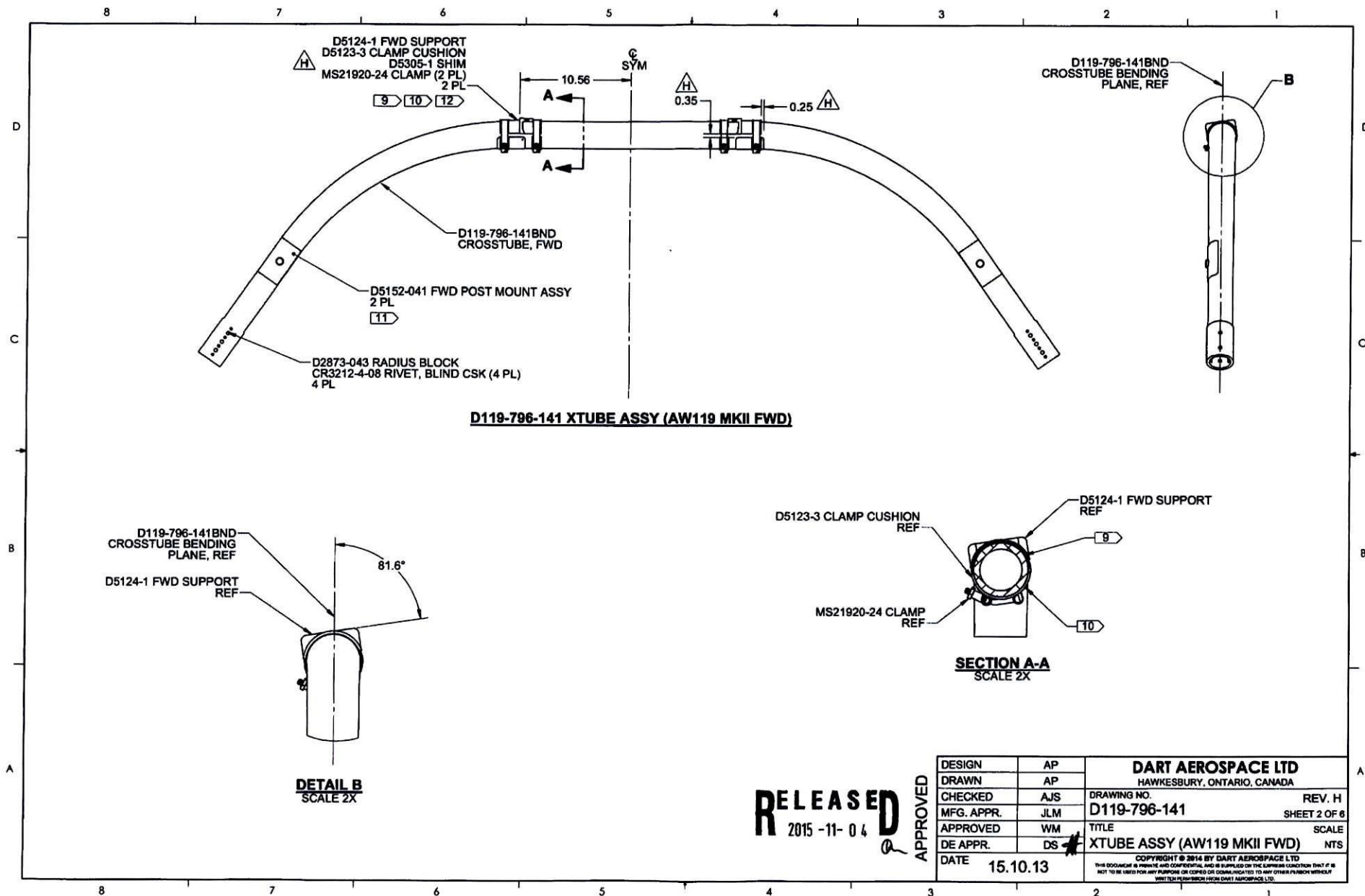
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NOTES:

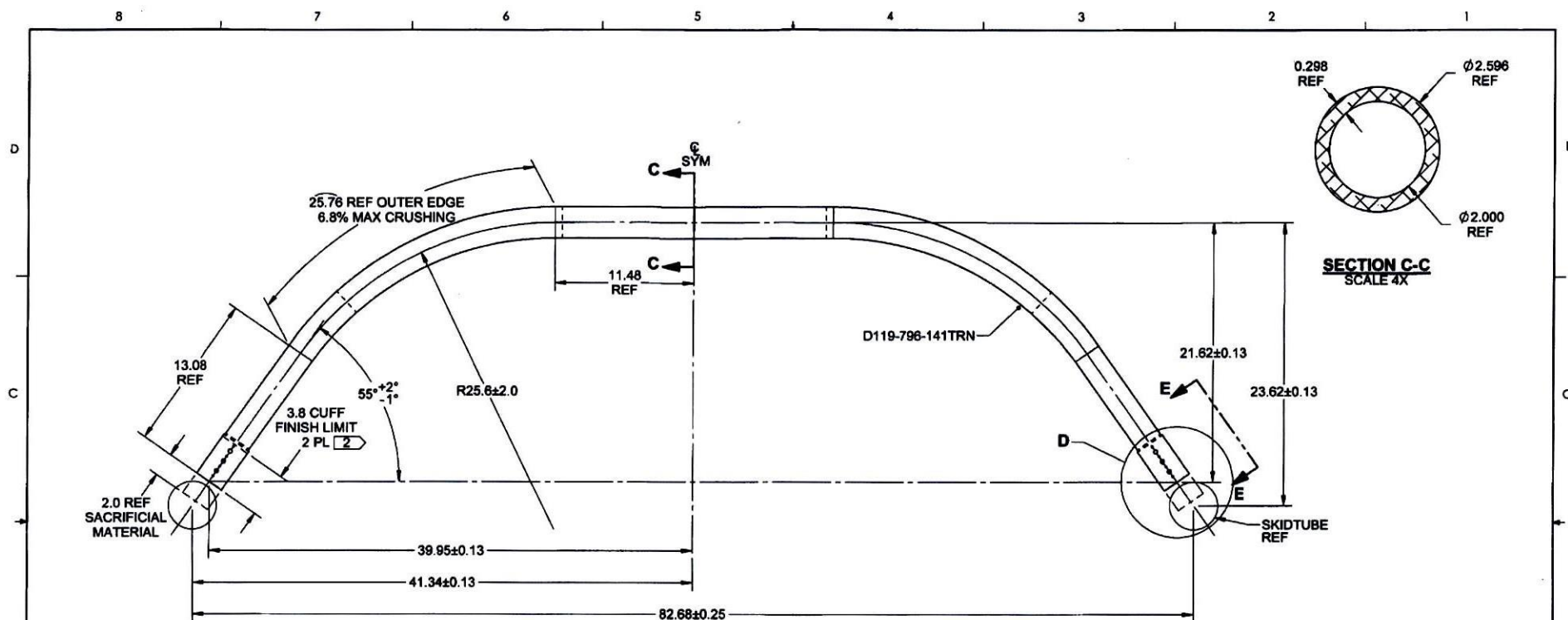
- 1) MATERIAL: N/A
- 2) FINISH: APPLY MATTE CLEAR COAT PER QSI 005 4.2  
MASK D5124-1 FWD SUPPORTS, D5305-1 SHIMS AS WELL AS UNDERSIDE OF CROSSTUBE AS SHOWN (B3-1, HATCHED AREA),  
PAINT OUTSIDE PER DART QSI 005 4.2 AFTER APPLYING CLEAR COAT  
DO NOT APPLY FINISH (PAINT OR CLEAR COAT) TO CUFFS IN LOCATION SHOWN, MASK PRIOR TO FINISHING
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: IDENTIFY USING PART NUMBER "D119-796-141" AND BATCH NUMBER ON INSIDE OF CUFF PER QSI 044 6.4
- 7) WEIGHT: 18.54 lbs
- 8) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE.  
THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM DEFECTS SUCH AS SCRATCHES, NICKS OR DENTS.  
DEFECTS UP TO 0.005 MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 9) PRIOR TO FINISHING, ABRASE MATING SURFACES OF D5124-1 FWD SUPPORTS AND CROSSTUBE WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH'N'WIPE DEGREASER. APPLY A 0.1 MIN THK LAYER OF PROSEAL 890 ON THE INSIDE CONCAVE SURFACE OF THE D5124-1 FWD SUPPORTS AND INSTALL AT AN 8.4" OFFSET FROM THE CROSSTUBE BENDING PLANE. INSTALL THE MS21920-24 CLAMPS AND D5123-3 CLAMP CUSHIONS WHILE WET.
- 10) TORQUE MS21920 CLAMPS 80 - 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY, THE NUT IS FACING AFT AND HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.
- 11) PRIOR TO FINISHING, ABRASE MATING SURFACES OF CROSSTUBE AND D5152-041 WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH'N'WIPE DEGREASER. INSTALL D5152-041 WITH LAYER OF PROSEAL 890 ON INSIDE CONCAVE SURFACE, 0.1 MIN THK. LOCATE D5152-041 USING TOOL DT10089.
- 12) PRIOR TO FINISHING, ABRASE MATING SURFACES OF CROSSTUBE AND D5305-1 SHIM WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH'N'WIPE DEGREASER. INSTALL D5305-1 SHIM WITH LAYER OF PROSEAL 890 ON INSIDE CONCAVE SURFACE, 0.1 MIN THK. USE ADDITIONAL TEMPORARY MS21920-24 CLAMP TO APPLY CLAMPING PRESSURE FOR 72 HOURS.

|            |                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| H          | ADD D5305-1 SHIM, D6024-103 WAS D6005-103, D5124-1 NOW INSTALLED ON PRIMER                                                                                                     | AP                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15.10.13 |
| G          | FINISHING ORDER ADJUSTED, CR3212-4-08 WAS -07, CUFF DIA TOLERANCE INCREASED TO +/- 0.005                                                                                       | AP                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15.04.24 |
| F          | REMOVED PRIME/ PAINT ON CUFFS. 2.516 WAS 2.500 (C8-5)                                                                                                                          | AP                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15.02.03 |
| E          | D5152-041 FWD STEP POST ASSY WAS D5150-1 STEP POST, SCOTCH BRITE 7447 RED WAS 180 GRIT SANDPAPER, ANGLE (B7-2) DIMENSIONED FROM NEW DATUM                                      | DB                                                                                                                                                                                                                                                                                                                                                                                                                                               | 15.01.15 |
| D          | ADD D5150-1 STEP POST (2X), MOVED INSPECTION WINDOW DETAIL TO SHEET 1, MODIFIED NOTES ON SHT 1 & 3                                                                             | DB                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14.11.25 |
| C          | CR3212-4-07 RIVETS WERE CR3212-4-09, 7.5 DEG CUFF ANGLE OFFSET REMOVED (SHT 3), CUFF DIAMETER ON D119-796-141TRN REDUCED TO 2.500, ADDED INSPECTION WINDOW (B7-3), ADDED SHT 4 | AP                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14.10.23 |
| B          | ADDED D2873-043 RADIUS BLOCK, CR3212-4-09 RIVETS, ADDED SKIDTUBE REFERENCE FOR LOCATING CUFF HOLES, RE-ORGANIZED NOTES AND REMOVED REDUNDANT INFORMATION                       | AP                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14.09.02 |
| A          | NEW ISSUE                                                                                                                                                                      | AP                                                                                                                                                                                                                                                                                                                                                                                                                                               | 14.08.09 |
| REV.       | DESCRIPTION                                                                                                                                                                    | BY                                                                                                                                                                                                                                                                                                                                                                                                                                               | DATE     |
| DESIGN     | AP                                                                                                                                                                             | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA<br>DRAWING NO. <b>D119-796-141</b> REV. H<br>SHEET 1 OF 6<br>TITLE <b>XTUBE ASSY (AW119 MKII FWD)</b> SCALE NTS<br>COPYRIGHT © 2014 BY DART AEROSPACE LTD<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION FROM DART AEROSPACE LTD. |          |
| DRAWN      | AP                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |
| CHECKED    | AJS                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |
| MFG. APPR. | JLM                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |
| APPROVED   | WM                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |
| DE APPR.   | DS                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |
| DATE       | 15.10.13                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |

APPROVED







**D119-796-141BND CROSSTUBE, FWD**   
BENDING AND DRILLING DETAIL

**NOTES:**

- 1) MATERIAL: MADE FROM D119-796-141TRN
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
DO NOT APPLY PRIMER TO CUFFS IN LOCATION SHOWN, MASK PRIOR TO FINISHING
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 16.70 lbs
- 8) PART IS SYMMETRICAL ABOUT CENTERLINE
- 9) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6.8% BASED ON OD.
- 10) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038
- 11) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM DEFECTS SUCH AS SCRATCHES, NICKS OR DENTS. DEFECTS UP TO 0.005 MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

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2015-11-04

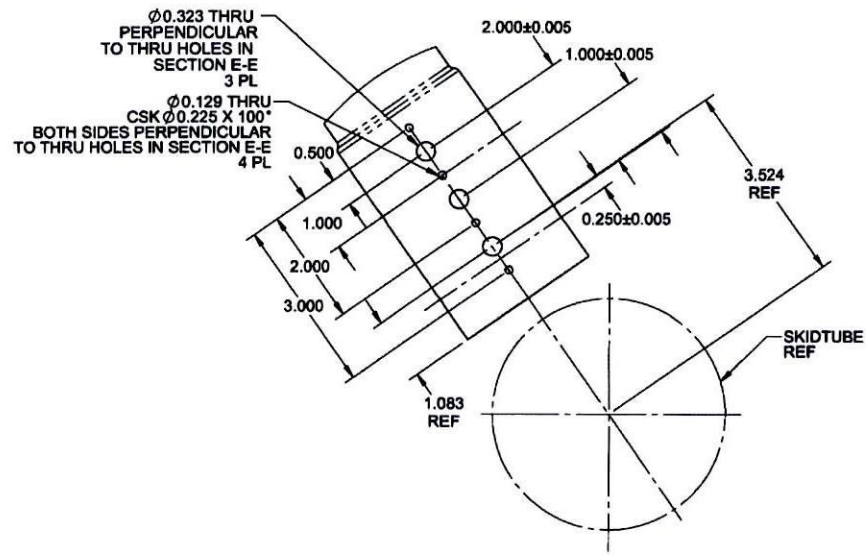
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|            |          |                                                                                                                                                                                                                                                                                          |              |
|------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | AP       | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                                                |              |
| DRAWN      | AP       | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                                              |              |
| CHECKED    | AJS      | DRAWING NO.                                                                                                                                                                                                                                                                              | REV. H       |
| MFG. APPR. | JLM      | D119-796-141                                                                                                                                                                                                                                                                             | SHEET 3 OF 6 |
| APPROVED   | WM       | TITLE                                                                                                                                                                                                                                                                                    | SCALE        |
| DE APPR.   | DS       | XTUBE ASSY (AW119 MKII FWD)                                                                                                                                                                                                                                                              | NTS          |
| DATE       | 15.10.13 | <small>COPYRIGHT © 2014 BY DART AEROSPACE LTD<br/>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small> |              |

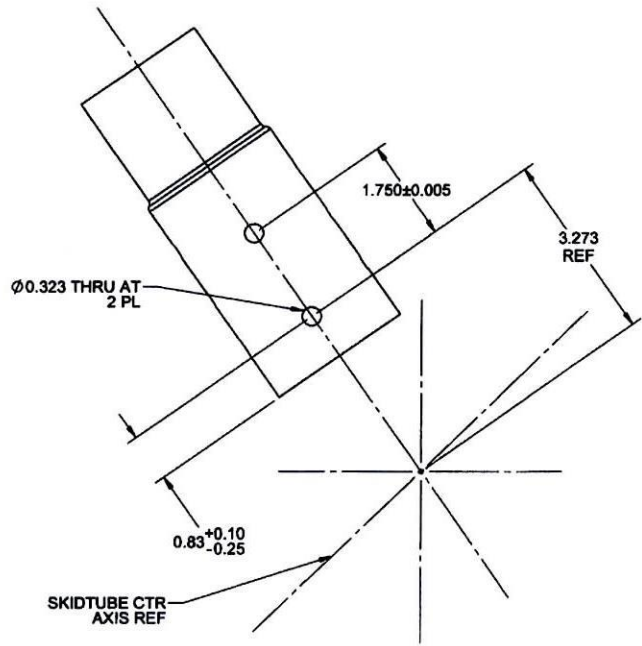


8 7 6 5 4 3 2 1

D  
C  
B  
A



**VIEW D**  
SCALE 4X



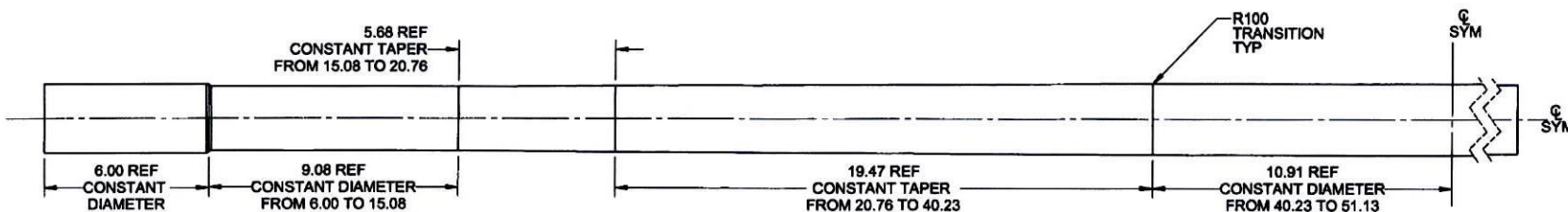
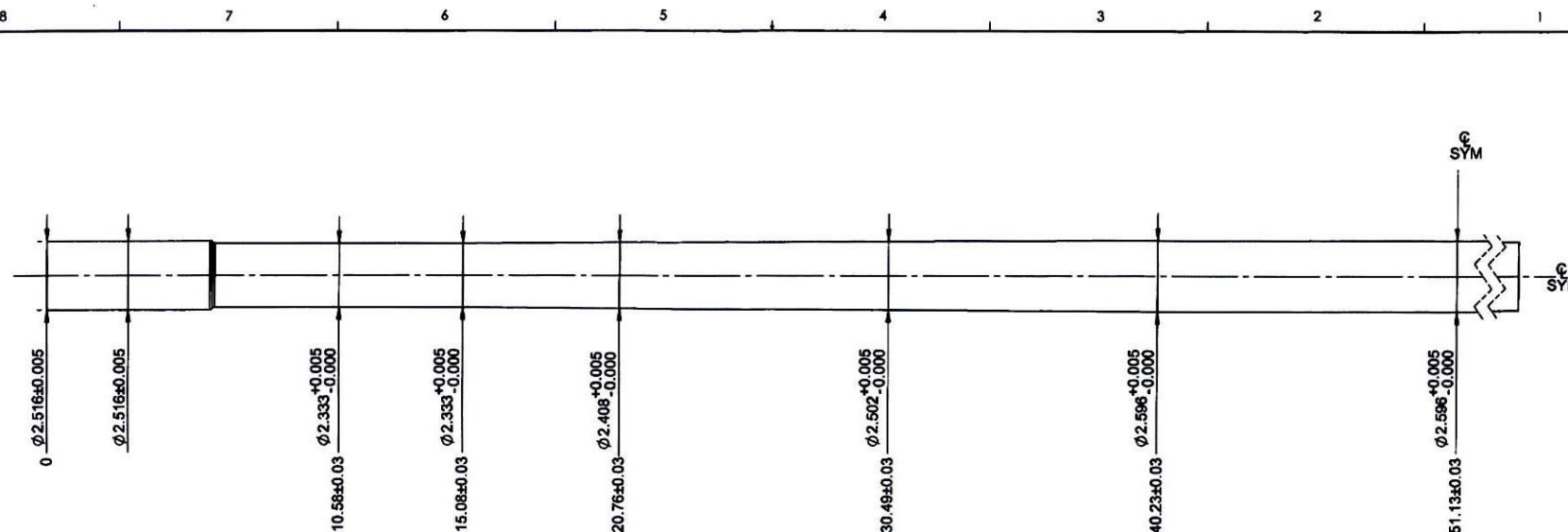
**VIEW E-E**  
SCALE 2X

**RELEASED**  
2015-11-04

APPROVED

|            |          |                                                                                                                                                                                                                                                                             |              |
|------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | AP       | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                                   |              |
| DRAWN      | AP       | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                                 |              |
| CHECKED    | AJS      | DRAWING NO.                                                                                                                                                                                                                                                                 | REV. H       |
| MFG. APPR. | JLM      | D119-796-141                                                                                                                                                                                                                                                                | SHEET 4 OF 6 |
| APPROVED   | WM       | TITLE                                                                                                                                                                                                                                                                       | SCALE        |
| DE APPR.   | DS       | XTUBE ASSY (AW119 MKII FWD)                                                                                                                                                                                                                                                 | NTS          |
| DATE       | 15.10.13 | COPYRIGHT © 2014 BY DART AEROSPACE LTD<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE SAME BASIS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD. |              |

8 7 6 5 4 3 2 1



**D119-796-141TRN CROSSTUBE, FWD**

**NOTES:**

- 1) MATERIAL: MANUFACTURE FROM D6024-103 (PREFERRED) OR D6005-103  
FINISHED LENGTH = 102.26 ±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 16.70 lbs
- 8) PART IS SYMMETRICAL ABOUT CENTERLINE

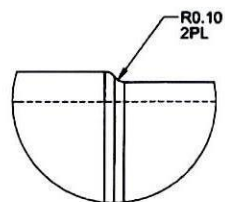
**RELEASED**  
2015-11-04

**APPROVED**

|            |          |                                                                                                                                                                                                                                                                                |              |
|------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | AP       | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                       |              |
| DRAWN      | AP       |                                                                                                                                                                                                                                                                                |              |
| CHECKED    | AJS      | DRAWING NO.                                                                                                                                                                                                                                                                    | REV. H       |
| MFG. APPR. | JLM      | <b>D119-796-141</b>                                                                                                                                                                                                                                                            | SHEET 5 OF 6 |
| APPROVED   | WM       | TITLE                                                                                                                                                                                                                                                                          | SCALE        |
| DE APPR.   | DS       | <b>XTUBE ASSY (AW119 MKII FWD)</b>                                                                                                                                                                                                                                             | NTS          |
| DATE       | 15.10.13 | COPYRIGHT © 2014 BY DART AEROSPACE LTD<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS<br>NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT<br>WRITTEN PERMISSION FROM DART AEROSPACE LTD |              |



**D119-796-141TRN CROSSTUBE, FWD**  
SUPPLEMENTAL VIEW: NOMINAL WALL THICKNESS



**DETAIL F**  
SCALE 2X

|            |          |                                                                                                                                                                                                                                                                                                   |              |
|------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | AP       | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                          |              |
| DRAWN      | AP       |                                                                                                                                                                                                                                                                                                   |              |
| CHECKED    | AJS      | DRAWING NO.                                                                                                                                                                                                                                                                                       | REV. H       |
| MFG. APPR. | JLM      | <b>D119-796-141</b>                                                                                                                                                                                                                                                                               | SHEET 6 OF 6 |
| APPROVED   | WM       | TITLE                                                                                                                                                                                                                                                                                             | SCALE        |
| DE APPR.   | DS       | <b>XTUBE ASSY (AW119 MKII FWD)</b>                                                                                                                                                                                                                                                                | NTS          |
| DATE       | 15.10.13 | <small>COPYRIGHT © 2014 BY DART AEROSPACE LTD<br/>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS<br/>NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT<br/>WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small> |              |

**RELEASED**  
2015-11-04

APPROVED

CHAMFER ID  
AS REQUIRED  
FOR TOOLING

F

SYM

SYM

0.258 REF  
NOMINAL WALL

0.167 REF  
NOMINAL WALL  
10.58±0.03

0.167 REF  
NOMINAL WALL  
15.08±0.03

0.204 REF  
NOMINAL WALL  
20.76±0.03

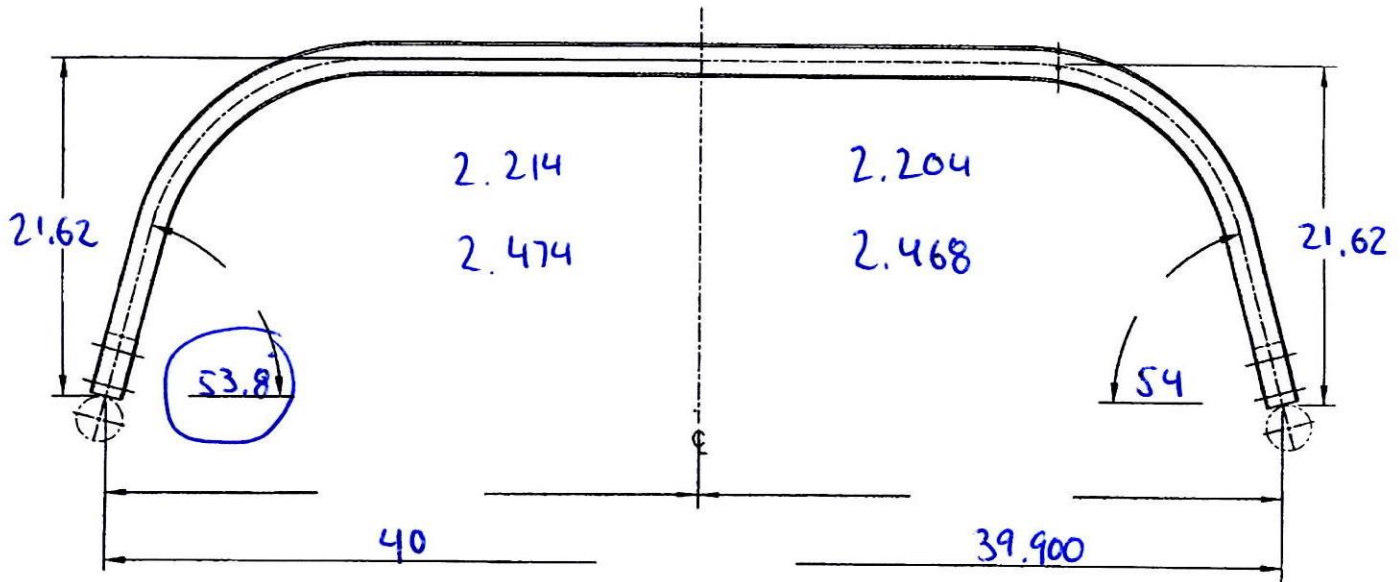
0.251 REF  
NOMINAL WALL  
30.49±0.03

0.298 REF  
NOMINAL WALL  
40.23±0.03

0.298 REF  
NOMINAL WALL  
51.13±0.03

|                                                   |  |                     |              |
|---------------------------------------------------|--|---------------------|--------------|
| <b>DART AEROSPACE LTD</b>                         |  | <b>Work Order:</b>  | 5062453      |
| <b>Description:</b> Crosstube Fwd, with Step      |  | <b>Part Number:</b> | D119-796-141 |
| <b>Inspection Dwg:</b> D119-796-141 <b>Rev:</b> H |  | <b>Page 1 of 1</b>  |              |

| Required Dimension | Min    | Max    |
|--------------------|--------|--------|
| Height             | 21.490 | 21.750 |
| 1/2 Span           | 39.820 | 40.080 |
| Angle              | 54°    | 57°    |
| Total Span         | 79.640 | 80.160 |
| Bending Passes     | 8      | --     |
| Crushing           | --     | 6.8%   |



|                | Side A | Side B |
|----------------|--------|--------|
| Bending Passes | 9      | 10     |
| Crushing       | 5.50%  | 5.70%  |
| Comments       |        |        |
|                |        |        |
|                |        |        |
|                |        |        |
|                |        |        |

\* See attached  
9/18/4/03

|                 |  |
|-----------------|--|
| QC15 Inspection |  |
| Date            |  |

| Rev | Date     | Change          | Revised by | Approved |
|-----|----------|-----------------|------------|----------|
| A   | 15.04.14 | New Issue       | KJ         |          |
| B   | 15.11.12 | Dwg Rev updated | KJ         |          |
| C   | 16.01.15 | Dwg Rev updated | KJ         | 4P       |

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



QA Closed: \_\_\_\_\_

Date: DEC 13 2018

## WORK ORDER NON-CONFORMANCE / UPDATE

Work Order update only ☐

| Work Order: <u>174966</u><br>Part No. <u>D119-796-141</u><br>NCR No. <u>18-7036</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>DISPOSITION</b><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input checked="" type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> | <b>AGAINST DEPARTMENT/PROCESS</b><br><table style="width:100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Cross tube <input checked="" type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table> |                                                            |                                                                                                                                                                        |                                               | Skid-tube <input type="checkbox"/> | Cross tube <input checked="" type="checkbox"/> | Water Jet <input type="checkbox"/> | Engineering <input type="checkbox"/> | Machining <input type="checkbox"/> | Small Fab <input type="checkbox"/>   | Prod. Eng. Coord. <input type="checkbox"/>  | Quality <input type="checkbox"/>         | Thermoforming <input type="checkbox"/>    | Finishing <input type="checkbox"/>        | Rec/Store/Packaging <input type="checkbox"/> | Other <input type="checkbox"/>  | Large Fab <input type="checkbox"/>           | Composite <input type="checkbox"/>          | Supplier <input type="checkbox"/> |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                              |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |              |  |  |  |                                        |                                   |
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| Skid-tube <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Cross tube <input checked="" type="checkbox"/>                                                                                                                                            | Water Jet <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Engineering <input type="checkbox"/>                       |                                                                                                                                                                        |                                               |                                    |                                                |                                    |                                      |                                    |                                      |                                             |                                          |                                           |                                           |                                              |                                 |                                              |                                             |                                   |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |      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                      |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |              |  |  |  |                                        |                                   |
| Machining <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Small Fab <input type="checkbox"/>                                                                                                                                                        | Prod. Eng. Coord. <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Quality <input type="checkbox"/>                           |                                                                                                                                                                        |                                               |                                    |                                                |                                    |                                      |                                    |                                      |                                             |                                          |                                           |                                           |                                              |                                 |                                              |                                             |                                   |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |                                         |                                       |                                   |                                                 |                                                            |                                             |                                            |                                              |                                          |                                |                                        |                                          |                                     |                                             |                                           |                                   |                                      |                                  |                                  |                                           |                                  |                                     |                                        |                                     |                                 |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |              |  |  |  |                                        |                                   |
| Thermoforming <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Other <input type="checkbox"/>                             |                                                                                                                                                                        |                                               |                                    |                                                |                                    |                                      |                                    |                                      |                                             |                                          |                                           |                                           |                                              |                                 |                                              |                                             |                                   |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |      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                      |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |              |  |  |  |                                        |                                   |
| Large Fab <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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                      |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |              |  |  |  |                                        |                                   |
| Date: <u>18/4/23</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Step #: <u>110</u>                                                                                                                                                                        | QTY Effective: <u>2</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | MRB (QSI042) Approval<br>DAS 12 9-89 <u>18/4/23</u>        |                                                                                                                                                                        |                                               |                                    |                                                |                                    |                                      |                                    |                                      |                                             |                                          |                                           |                                           |                                              |                                 |                                              |                                             |                                   |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |      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                      |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |              |  |  |  |                                        |                                   |
| <b>Description Work Order Deviation</b><br><br>Angle after bending is under tolerance.<br>Angle = 53.8°                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                           | <b>Disposition</b><br><br>Acceptable, will not cause fit issue.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                            | Completed By<br>DAS 12 9-89 <u>18/4/23</u><br>Lead hand / Supervisor Approval Verification<br><u>PD 18-08-03</u><br>QC / QA Coordinator Approval<br><u>PD 18-08-03</u> |                                               |                                    |                                                |                                    |                                      |                                    |                                      |                                             |                                          |                                           |                                           |                                              |                                 |                                              |                                             |                                   |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |      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                      |                              |                                              |                                             |                                                          |                                       |                                  |                                     |                                              |                                        |                                      |                                                |                                           |                                           |                                                |              |  |  |  |                                        |                                   |
| <table style="width:100%;"> <tr> <th colspan="2" style="text-align: left;">Root Cause</th> <th colspan="4" style="text-align: left;">FAULT CATEGORY</th> </tr> <tr> <td style="width:15%;">Environment <input type="checkbox"/></td> <td style="width:15%;">No Re-verification <input type="checkbox"/></td> <td style="width:15%;">Pressure/Forced <input type="checkbox"/></td> <td style="width:15%;">Temperature/Cure <input type="checkbox"/></td> <td style="width:15%;">Power Loss/Surge <input type="checkbox"/></td> <td style="width:15%;">Positioned Wrong <input type="checkbox"/></td> </tr> <tr> <td>Design <input type="checkbox"/></td> <td>Operator <input checked="" type="checkbox"/></td> <td>Bending <input checked="" type="checkbox"/></td> <td>Set-up <input type="checkbox"/></td> <td>Folio/Program <input type="checkbox"/></td> <td>Outside Dimensions <input type="checkbox"/></td> </tr> <tr> <td>Doc/Data <input type="checkbox"/></td> <td>Offset/Setup <input type="checkbox"/></td> <td>Centre Not Concentric <input type="checkbox"/></td> <td>BOM/Route <input type="checkbox"/></td> <td>Grain <input type="checkbox"/></td> <td>Over/Under tolerance <input type="checkbox"/></td> </tr> <tr> <td>Equip/Tooling <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td>Cracks <input type="checkbox"/></td> <td>Broken/Damage/Defect <input type="checkbox"/></td> <td>Weld <input type="checkbox"/></td> <td>Part Incorrect <input type="checkbox"/></td> </tr> <tr> <td>Handling/Pre <input type="checkbox"/></td> <td>Training <input type="checkbox"/></td> <td>Crimp/Kink/Ripple/Wave <input type="checkbox"/></td> <td>Inspection Incomplete/Unqualified <input type="checkbox"/></td> <td>Wrong Stock Pulled <input type="checkbox"/></td> <td>Part Lost/Missing <input type="checkbox"/></td> </tr> <tr> <td>Material <input checked="" type="checkbox"/></td> <td>Use for Testing <input type="checkbox"/></td> <td>Cuffs <input type="checkbox"/></td> <td>Contamination <input type="checkbox"/></td> <td>Out of Sequence <input type="checkbox"/></td> <td>Part Moved <input type="checkbox"/></td> </tr> <tr> <td>Internal Transport <input type="checkbox"/></td> <td>Poor Information <input type="checkbox"/></td> <td>Crushing <input type="checkbox"/></td> <td>Countersink <input type="checkbox"/></td> <td>Off-set <input type="checkbox"/></td> <td>Drawing <input type="checkbox"/></td> </tr> <tr> <td>Tribal Knowledge <input type="checkbox"/></td> <td>Rushing <input type="checkbox"/></td> <td>Heat Treat <input type="checkbox"/></td> <td>Cut Too Short <input type="checkbox"/></td> <td>Mislabeled <input type="checkbox"/></td> <td>Finish <input type="checkbox"/></td> </tr> <tr> <td>LOA <input type="checkbox"/></td> <td>Product Improvement <input type="checkbox"/></td> <td>Wave/Twist in Tube <input type="checkbox"/></td> <td>Instructions Incomplete/Unclear <input type="checkbox"/></td> <td>Fit/Function <input type="checkbox"/></td> <td>Misread <input type="checkbox"/></td> </tr> <tr> <td>Substation <input type="checkbox"/></td> <td>Process Improvement <input type="checkbox"/></td> <td>Marks/Chatter <input type="checkbox"/></td> <td>Drill Holes <input type="checkbox"/></td> <td>Misaligned/off center <input type="checkbox"/></td> <td>Turning Sequence <input type="checkbox"/></td> </tr> <tr> <td>Past Expiry Date <input type="checkbox"/></td> <td>Manufacturing Process <input type="checkbox"/></td> <td colspan="4" rowspan="2">OTHER: _____</td> </tr> <tr> <td>Misidentified <input type="checkbox"/></td> <td>Past Due <input type="checkbox"/></td> </tr> </table> |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                            |                                                                                                                                                                        | Root Cause                                    |                                    | FAULT CATEGORY                                 |                                    |                                      |                                    | Environment <input type="checkbox"/> | No Re-verification <input type="checkbox"/> | Pressure/Forced <input type="checkbox"/> | Temperature/Cure <input type="checkbox"/> | Power Loss/Surge <input type="checkbox"/> | Positioned Wrong <input type="checkbox"/>    | Design <input type="checkbox"/> | Operator <input checked="" type="checkbox"/> | Bending <input checked="" type="checkbox"/> | Set-up <input type="checkbox"/>   | Folio/Program <input type="checkbox"/> | Outside Dimensions <input type="checkbox"/> | Doc/Data <input type="checkbox"/> | Offset/Setup <input type="checkbox"/> | Centre Not Concentric <input type="checkbox"/> | BOM/Route <input type="checkbox"/> | Grain <input type="checkbox"/> | Over/Under tolerance <input type="checkbox"/> | Equip/Tooling <input type="checkbox"/> | Supplier <input type="checkbox"/> | Cracks <input type="checkbox"/> | Broken/Damage/Defect <input type="checkbox"/> | Weld <input type="checkbox"/> | Part Incorrect <input type="checkbox"/> | Handling/Pre <input type="checkbox"/> | Training <input type="checkbox"/> | Crimp/Kink/Ripple/Wave <input type="checkbox"/> | Inspection Incomplete/Unqualified <input type="checkbox"/> | Wrong Stock Pulled <input type="checkbox"/> | Part Lost/Missing <input type="checkbox"/> | Material <input checked="" type="checkbox"/> | Use for Testing <input type="checkbox"/> | Cuffs <input type="checkbox"/> | Contamination <input type="checkbox"/> | Out of Sequence <input type="checkbox"/> | Part Moved <input type="checkbox"/> | Internal Transport <input type="checkbox"/> | Poor Information <input type="checkbox"/> | Crushing <input type="checkbox"/> | Countersink <input type="checkbox"/> | Off-set <input type="checkbox"/> | Drawing <input type="checkbox"/> | Tribal Knowledge <input type="checkbox"/> | Rushing <input type="checkbox"/> | Heat Treat <input type="checkbox"/> | Cut Too Short <input type="checkbox"/> | Mislabeled <input type="checkbox"/> | Finish <input type="checkbox"/> | LOA <input type="checkbox"/> | Product Improvement <input type="checkbox"/> | Wave/Twist in Tube <input type="checkbox"/> | Instructions Incomplete/Unclear <input type="checkbox"/> | Fit/Function <input type="checkbox"/> | Misread <input type="checkbox"/> | Substation <input type="checkbox"/> | Process Improvement <input type="checkbox"/> | Marks/Chatter <input type="checkbox"/> | Drill Holes <input type="checkbox"/> | Misaligned/off center <input type="checkbox"/> | Turning Sequence <input type="checkbox"/> | Past Expiry Date <input type="checkbox"/> | Manufacturing Process <input type="checkbox"/> | OTHER: _____ |  |  |  | Misidentified <input type="checkbox"/> | Past Due <input type="checkbox"/> |
| Root Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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| Environment <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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          |                                    |                                      |                                             |                                          |                                           |                                           |                                              |                                 |                                              |                                             |                                   |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |      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| Design <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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          |                                    |                                      |                                             |                                          |                                           |                                           |                                              |                                 |                                              |                                             |                                   |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |      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| Doc/Data <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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          |                                    |                                      |                                             |                                          |                                           |                                           |                                              |                                 |                                              |                                             |                                   |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |      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| Equip/Tooling <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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          |                                    |                                      |                                             |                                          |                                           |                                           |                                              |                                 |                                              |                                             |                                   |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |      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| Handling/Pre <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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          |                                    |                                      |                                             |                                          |                                           |                                           |                                              |                                 |                                              |                                             |                                   |                                        |                                             |                                   |                                       |                                                |                                    |                                |                                               |                                        |                                   |                                 |                                               |                               |      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| Material <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| Internal Transport <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| Tribal Knowledge <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| LOA <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| Substation <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| Past Expiry Date <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| Misidentified <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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Dart Aerospace Ltd.  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada

Tel (613) 632-5200

# PURCHASE ORDER PO039746

**Supplier:** SKY002-VC  
Skyservice  
6120 Midfield Road  
Mississauga  
ON  
L5P 1B1 Canada  
Phone: 905-678-5636  
Fax: 905-678-5841

**PO No:** PO039746  
**PO Date:** 4/30/18  
**Due Date:** 5/1/18  
**Purchase Order Revision:**  
**Revision Date:**  
**Ship-To Contact:** Lavoie, Chantal  
Phone: clavoie@dartaero.com

**Ship To:** 1270 Aberdeen Street  
Hawkesbury  
ON  
K6A 1K7 Canada  
Phone: 613-632-5200

**Via:** Ground  
**Pymt Terms:** Net 30  
**Freight Terms:**  
**Special Comments:**

## Items

| Line Item         | Job    | Part         | Description                                                                                                                                                                                                                                   | Status | Due Date | Order Quantity | Received Quantity | Balance  | Unit Price (CAD) | Extended Price  |
|-------------------|--------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|----------------|-------------------|----------|------------------|-----------------|
| 1                 | 176151 | D119-796-141 | Fwd Crosstube Installation Without Step (No Hardware)<br>*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038Or Issue P/O: _____ LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order | Firmed | 5/1/18   | 1 pcs          | 0 pcs             | 1 pcs    | \$208.75/pcs     | \$208.75        |
|                   | 174965 |              |                                                                                                                                                                                                                                               | Firmed | 5/1/18   | 1 pcs          | 1 x 0 pcs         | 1 pcs    | \$208.75/pcs     | \$208.75        |
|                   | 174966 |              |                                                                                                                                                                                                                                               | Firmed | 5/1/18   | 1 pcs          | 1 x 0 pcs         | 1 pcs    | \$208.75/pcs     | \$208.75        |
|                   | 174967 |              |                                                                                                                                                                                                                                               | Firmed | 5/1/18   | 1 pcs          | 1 x 0 pcs         | 1 pcs    | \$208.75/pcs     | \$208.75        |
| <b>Sub Total:</b> |        |              |                                                                                                                                                                                                                                               |        |          | <b>4</b>       | <b>0</b>          | <b>4</b> |                  | <b>\$835.00</b> |

**Grand Total:** \$835.00

## Order Notes

re'd 1/18/05/1

### Procurement Quality Clauses

A005 right of entry  
A012 chemical and physical test report  
A016 personnel qualification  
A017 raw material identification (as applicable)

A022 Apical Processing  
A024 process certifications  
A026 certification of material conformance

A041 quality management system  
A042 dart notification by supplier  
A043 retention of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit [www.dartaerospace.com](http://www.dartaerospace.com) for further explanation.

**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

10105 Ryan Avenue, Dorval, Quebec, H9P 1A2

TCCA AMO 53-89 / EASA 145.7142 / BDA AMO 385

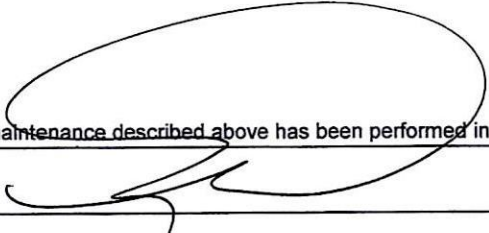
|                          |                                      |                      |                            |
|--------------------------|--------------------------------------|----------------------|----------------------------|
| <b>WO #:</b> MWO35839    | <b>Customer:</b> Dart Aerospace Ltd. | <b>Dept:</b> NDT YUL | <b>Reference:</b> PO039746 |
| <b>Descr:</b>            | <b>PN:</b>                           | <b>S/N:</b>          | <b>Qty:</b> 1              |
| <b>Make:</b>             | <b>Model:</b>                        | <b>Reg:</b>          | <b>A/C S/N:</b>            |
| <b>TSN:</b>              | <b>CSN:</b>                          | <b>TSO:</b>          |                            |
| <b>Task: UNSCHEDULED</b> |                                      |                      | <b>Sequence:</b> 1         |

**Work Required:**

CARRY OUT NDT ON 4 FWD CROSSTUBES , P/N# D119-796-141 , J/S# 176151 , 174965 , 174966 , 174967

|                                                                                 |                 |            |            |              |                |               |                                                                                                                                                                            |
|---------------------------------------------------------------------------------|-----------------|------------|------------|--------------|----------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Action Taken:</b>                                                            |                 |            |            |              |                | <b>Date:</b>  | <b>Initial/Stamp:</b>                                                                                                                                                      |
| LPI C/O IAW ASTM E-1417M-13                                                     |                 |            |            |              |                | APR 30 2018   | <br> |
| NO CRACK FOUND                                                                  |                 |            |            |              |                |               |                                                                                                                                                                            |
| PEN. ZL-56, MPO13600, CLEANER SKC-S MPO13923 , DEV. MPO11715 , UV LIGHT M-20142 |                 |            |            |              |                |               |                                                                                                                                                                            |
| <i>Description</i>                                                              | <i>Location</i> | <i>P/N</i> | <i>Qty</i> | <i>Batch</i> | <i>S/N Off</i> | <i>S/N On</i> |                                                                                                                                                                            |
|                                                                                 |                 |            |            |              |                |               |                                                                                                                                                                            |
|                                                                                 |                 |            |            |              |                |               |                                                                                                                                                                            |
|                                                                                 |                 |            |            |              |                |               |                                                                                                                                                                            |
|                                                                                 |                 |            |            |              |                |               |                                                                                                                                                                            |
|                                                                                 |                 |            |            |              |                |               |                                                                                                                                                                            |
|                                                                                 |                 |            |            |              |                |               |                                                                                                                                                                            |

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

|                                    |                                                                                     |                                                                                       |              |
|------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------|
| <b>Signature:</b>                  |  | <b>ACA/SCA Stamp</b>                                                                  | <b>Date:</b> |
| <b>Name:</b> <b>RAFIK MELIKIAN</b> |                                                                                     |  | APR 30 2018  |